UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/733,862	12/10/2003	Torsten Berger	SNS-013	8061

51414 7590 07/27/2009

GOODWIN PROCTER LLP
PATENT ADMINISTRATOR
53 STATE STREET
EXCHANGE PLACE
BOSTON, MA 02109-2881

EXAMINER	
CASCHERA, ANTONIO A	
ART UNIT	PAPER NUMBER
2628	

NOTIFICATION DATE	DELIVERY MODE
07/27/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PatentBos@goodwinprocter.com
hmcpeake@goodwinprocter.com
glenn.williams@goodwinprocter.com

Office Action Summary	Application No.	Applicant(s)	
	10/733,862	BERGER ET AL.	
	Examiner	Art Unit	
	Antonio A. Caschera	2628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 April 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *56-67 and 69-75* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *56-67 and 69-75* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 June 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 56, 57, 65-67 and 69-75 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dumesny et al. (U.S. Pub 2002/0154132 A1) in view of Piponi et al. ("Seamless texture mapping of subdivision surfaces by model pelting and texture blending," SIGGRAPH 2000. ACM Press/Addison-Wesley Publishing Co. New York, NY. pgs. 471-478. ISBN:1-58113-208-5).

In reference to claim 56, Dumesny et al. disclsoes a method for wrapping a texture onto a surface of a three-dimensional virtual object (see paragraph 9, lines 1-5, paragraph 13, lines 1-7 and paragraph 76, lines 7-11), the method comprising:

(i) rendering an arbitrarily-shaped region of the surface of the three-dimensional virtual object in response to a user manipulation of a graphical user interface device (see paragraphs 2, 10, 13, 38, lines 5-9, paragraphs 44, 47, 48 and #110, 111 of Figure 11A wherein Dumesny et al. discloses allowing the user to select a defined region, using a user input device such as a mouse, of a 3D graphic object and map the selected regions to a texture map. Dumesny et al. explicitly describes the 3D graphic object of which the user is capable of texture mapping, via the selection

of a region of the graphic object, as having, "...arbitrarily complex surfaces," (see paragraph 14 more specifically lines 1-6, right column, page 2 and paragraph 67, lines 1-5). Even further Dumesny et al. explicitly discloses the user capable of modifying a texture mapping for an arbitrary set of the object's polygons (see paragraph 15));

(ii) defining a first patch over the user-defined region (see paragraph 48, last 3 lines and paragraph 49 wherein Dumesny et al. further discloses allowing the user to adjust the square region size and shape, in texture space, which inherently alters the mapping of the texture to the object space defined region. Further, since the user defined region of the object is only part of the object and the alteration of the texture square region modifies the mapping onto such a user defined region, the Examiner interprets such a user defined region equivalent to the “patch” of Applicant’s claim.), *the patch being a NURBS patch*;

(iii) for each of a plurality of locations in the user-defined region, mapping the location to a corresponding location in a texture according to a mapping scheme wherein points of a planar mesh are adjusted to account for a spacing of corresponding points within the user-defined region of the surface of the three-dimensional virtual object, and wherein the texture is superimposed onto a second patch based on the adjusted planar mesh (see paragraphs 4 and 5 wherein Dumesny et al. also discloses assigning texture map coordinate values to the corresponding polygons since when Dumesny et al. performs texture mapping, coordinates of object space and texture map space are associated and texture values are therefore also inherently associated. Note, the Examiner interprets such texture space square region equivalent to Applicant’s “planar mesh” limitation.); and

(iv) assigning to each location in the arbitrarily-shaped, user-defined region a graphical value associated with the corresponding location in the texture, wherein the points of the planar mesh are adjusted to improve a quality metric associated with the spacing of corresponding points within the user-defined region of the surface of the three-dimensional virtual object, *wherein the mapping scheme models at least a plurality of the points of the planar mesh as connected by mechanical modeling elements, and wherein the points of the planar mesh are adjusted to reduce an energy associated with the mechanical modeling elements* (see paragraphs 14, 15, 44, 47, paragraph 48, last 3 lines, paragraph 49, paragraph 67, Figures 4 & 9B wherein Dumesny et al. further discloses allowing the user to adjust the square region size and shape, in texture space, which inherently alters the mapping of the texture to the object space defined region. The Examiner interprets the "graphical value" of Applicant's claim equivalent to the texture value comprised within a texture map as seen in Figure 4 of Dumesny et al.. Dumesny et al. explicitly discloses, in the example of paragraph 49, that as the user transforms the square region, making it smaller in size, the object space user defined region is updated in real time so that the texture map is now stretched over the user defined region. The Examiner interprets that if reducing the size of the texture space square region results in a loss of quality, because of stretching the texture map over the object, increasing the size of the texture space would conversely provide the effect of gaining quality since a smaller area of the object region would be covered by the texture. Dumesny et al. explicitly discloses allowing a user to select the region via one or more of particular polygons of a 3D graphic object to texture map data thereto. Dumesny et al. explicitly discloses that only if no polygons are selected by a user that all polygons forming the 3D object are subsequently textured. Also, Dumesny et al. explicitly

describes the 3D graphic object of which the user is capable of texture mapping, via the selection of a region of the graphic object, as having, "...arbitrarily complex surfaces". Even further Dumesny et al. explicitly discloses the user capable of modifying a texture mapping for an arbitrary set of the object's polygons).

Dumesny et al. does not explicitly disclose the mapping of models based on a plurality of points of the mesh connected by mechanical modeling elements. Piponi et al. discloses a method for finding both optimal and intuitive texture mapping over almost all of an entire subdivision surface and combining the mappings together to produce a seamless result (see last 4 lines of the abstract, pg. 471). Piponi et al. discloses the method to, for example, involve adding springs to the boundary of a disk with opposing ends of the springs attached to a surrounding fixed frame (see pg. 473, left column last paragraph "There are a number…" and Figure 2.). Piponi et al. also explicitly discloses minimizing the energy of the collection of springs using further derived equations of motion, adding damping terms and running a dynamics solver until a steady state is achieved (see pg. 473, left column, last paragraph, lines 1-10 and Figure 2). Note, the Examiner interprets such "springs" of Piponi et al. equivalent to Applicant's "mechanical modeling elements" since further claims 65 and 73 define the "mechanical modeling elements" as such. It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the texture mapping techniques of subdivision surfaces of Piponi et al. with the graphical object texturing techniques of Dumesny et al. in order to create a seamless texture mapping of polygonal models and subdivision surfaces while still creating a system that is efficient in its processing and intuitive for users to operate (see pg. 471, right column, "Introduction" lines 6-8 of Piponi et al. & see pg. 472, left column, lines 23-40, "Using a

solid…" of Piponi et al.). Although Dumesny et al. can be considered to utilize polygonal meshes for the "patches" of the regions, neither Dumesny et al. nor Piponi et al. explicitly disclose the use of NURBS patches as the geometric representation of the patches for the invention. At the time the invention was made, it would have been obvious to one of ordinary skill in the art to implement the use of NURBS patches with the invention of at least Dumesny et al.. Applicant has not disclosed that explicitly utilizing NURBS for representation of geometric regions provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with polygonal mesh representation of Dumesny et al. because the exact geometric representation utilized is a matter decided upon by the inventor and/or to which best suits the environment/application at hand. Even further, such rationale can be seen from Applicant's specification wherein Applicant explicitly discloses a multitude of different geometric representations for defining surface regions, one of which is explicitly stated as a polygonal mesh (see paragraph 20 of Applicant's specification). Therefore, it would have been obvious to one of ordinary skill in this art to modify the combination of Dumesny et al. and Piponi et al. to obtain the invention as specified in claim 56 (see *Response to Arguments* below).

In reference to claims 57 and 71, Dumesny et al. and Piponi et al. disclose all of the claim limitations as applied to claims 56 and 70 respectively in addition, Dumesny et al. discloses graphically rendering the object in real-time as the user modifies texture values (see paragraph 49).

In reference to claims 65, 66, 73 and 74, Dumesny et al. and Piponi et al. disclose all of the claim limitations as applied to claims 56 and 70 respectively. Piponi et al. discloses the

method to, for example, involve adding springs to the boundary of a disk with opposing ends of the springs attached to a surrounding fixed frame (see pg. 473, left column last paragraph “There are a number…” and Figure 2.).

In reference to claims 67 and 75, Dumesny et al. and Piponi et al. disclose all of the claim limitations as applied to claims 56 and 70 respectively. Piponi et al. also explicitly discloses minimizing the energy of the collection of springs using further derived equations of motion, adding damping terms and running a dynamics solver until a steady state is achieved (see pg. 473, left column, last paragraph, lines 1-10 and Figure 2).

In reference to claim 69, Dumesny et al. and Piponi et al. disclose all of the claim limitations as applied to claim 56 above. Dumesny et al. discloses allowing the user to select a defined region of a 3D graphic object and map the selected regions or polygons to a texture map (see paragraphs 13, 44, 47 and 48). Note, the Examiner sees no indication in Dumesny et al. of performing geometric projection when mapping the texture onto the 3D object in Dumesny et al.

In reference to claim 70, claim 70 is equivalent in scope to claim 1 and is therefore rejected under like rationale. In addition to the above rationale as applied to claim 1, claim 70 further claims an apparatus comprising, a memory storing code defining instructions and a processor for executing the instructions. Dumesny et al. discloses a storage medium or device, such as a CD-Rom, hard disk or magnetic disk for storing computer programs which, when executed, perform the above disclosed methods (see paragraphs 75-76). Also, Dumesny et al. discloses a processor for executing the above computer programs (see paragraph 75).

In reference to claim 72, Dumesny et al. and Piponi et al. disclose all of the claim limitations as applied to claim 71 above in addition, Dumesny et al. explicitly discloses utilizing a CRT as the display device (see paragraph 2).

2. Claims 58-64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dumesny et al. (U.S. Pub 2002/0154132 A1), Piponi et al. ("Seamless texture mapping of subdivision surfaces by model pelting and texture blending," SIGGRAPH 2000. ACM Press/Addison-Wesley Publishing Co. New York, NY. pgs. 471-478. ISBN:1-58113-208-5) and further in view of Leather et al. (U.S. Patent 6,707,458 B1).

In reference to claim 58, Dumesny et al. and Piponi et al. disclose all of the claim limitations as applied to claim 57 above however, neither Dumesny et al. nor Piponi et al. explicitly disclose modifying a voxel representation of the object according to the texture values. Leather et al. discloses a method and apparatus for texture tiling in a graphics system (see column 4, lines 38-40) wherein the texture is configured in a tile format (see column 4, lines 1-9 and Figure 20A). Leather et al. further discloses performing embossing type bump mapping effects on incoming processed texture coordinates (see columns 9-10, lines 56-3), the bump mapping further comprising a bump mapping displacement associated with each texture coordinate (see column 10, lines 8-20). Note, the Examiner interprets the depth/height of the object being altered using the texture bump mapping displacement values of Leather et al., equivalent to the modifying of a voxel representation of the object using the “graphical values” of Applicant’s claim. It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the texture tiling techniques of Leather et al. with the graphical object texturing techniques of Dumesny et al. and texture mapping techniques of

subdivision surfaces of Piponi et al. in order to create realistic looking surface detail on rendered objects while processing in an efficient and advantageous manner (see column 3, lines 35-36 and columns 3-4, lines 66-4 of Leather et al.).

In reference to claim 59, Dumesny et al. and Piponi et al. disclose all of the claim limitations as applied to claim 56 above however, neither Dumesny et al. nor Piponi et al. explicitly disclose the texture being of a tiled type. Leather et al. discloses a method and apparatus for texture tiling in a graphics system (see column 4, lines 38-40) wherein the texture is configured in a tile format (see column 4, lines 1-9 and Figure 20A). It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the texture tiling techniques of Leather et al. with the graphical object texturing techniques of Dumesny et al. and texture mapping techniques of subdivision surfaces of Piponi et al. in order to create realistic looking surface detail on rendered objects while processing in an efficient and advantageous manner (see column 3, lines 35-36 and columns 3-4, lines 66-4 of Leather et al.).

In reference to claim 60, Dumesny et al., Piponi et al. and Leather et al. disclose all of the claim limitations as applied to claim 59 above. Leather et al. discloses a method and apparatus for texture tiling in a graphics system (see column 4, lines 38-40) wherein the texture is configured in a tile format (see column 4, lines 1-9 and Figure 20A). Leather et al. also explicitly discloses improving on the past technique of texture tiling, which used to draw a polygon for each desired tile meaning each tile was constrained to align with a polygon (see column 4, lines 17-20).

In reference to claim 61, Dumesny et al., Piponi et al. and Leather et al. disclose all of the claim limitations as applied to claim 59 above. Dumesny et al. discloses graphically rendering

the object in real-time as the user modifies texture values (see paragraph 49). Leather et al. discloses a method and apparatus for texture tiling in a graphics system (see column 4, lines 38-40) wherein the texture is configured in a tile format (see column 4, lines 1-9 and Figure 20A).

In reference to claim 62, Dumesny et al. and Piponi et al. disclose all of the claim limitations as applied to claim 56 above. Dumesny et al. discloses assigning texture map coordinate values to the corresponding polygons since when Dumesny et al. performs texture mapping, coordinates of object space and texture map space are associated and texture values are therefore also inherently associated (see paragraphs 4 and 5). Note, the Examiner interprets the "graphical value" of Applicant's claim equivalent to the texture value comprised within a texture map as seen in Figure 4 of Dumesny et al.. Further, the texture value output from a texture map is well known in the art to be a color value as explicitly shown in Leather et al. (see Figures 7A and 7B). It would have been obvious to one of ordinary skill in the art at the time the invention was made to interpret the texture value, associated with the selected texture coordinate of a texture map, of Dumesny et al. and texture mapping techniques of subdivision surfaces of Piponi et al., with a color value since it is well known in the art that a texture map may hold color values, as shown in Leather et al. (see column 10, lines 31-36 of Leather et al.). It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the texturing techniques of Leather et al. with the graphical object texturing techniques of Dumesny et al. and texture mapping techniques of subdivision surfaces of Piponi et al. in order to create realistic looking surface detail on rendered objects while processing in an efficient and advantageous manner (see column 3, lines 35-36 and columns 3-4, lines 66-4 of Leather et al.).

In reference to claim 63, Dumesny et al. and Piponi et al. disclose all of the claim limitations as applied to claim 56 above. Although Dumesny et al. discloses assigning texture map coordinate values to corresponding polygons (see paragraphs 4 and 5), neither Dumesny et al. nor Piponi et al. explicitly disclose the texture map comprising an embossing pattern. Leather et al. discloses a method and apparatus for texture tiling in a graphics system (see column 4, lines 38-40) wherein the texture is configured in a tile format (see column 4, lines 1-9 and Figure 20A). Leather et al. further discloses performing embossing type bump mapping effects on incoming processed texture coordinates (see columns 9-10, lines 56-3), the bump mapping further comprising a bump mapping displacement associated with each texture coordinate (see column 10, lines 8-20 and Figures 7A, 7B). Further note, the Examiner interprets the displacement value of Leather et al. to inherently define an adjustment along a normal to the surface of a virtual object of Applicant's claim. It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the texturing techniques of Leather et al. with the graphical object texturing techniques of Dumesny et al. and texture mapping techniques of subdivision surfaces of Piponi et al. in order to create realistic looking surface detail on rendered objects while processing in an efficient and advantageous manner (see column 3, lines 35-36 and columns 3-4, lines 66-4 of Leather et al.).

In reference to claim 64, Dumesny et al., Piponi et al. and Leather et al. disclose all of the claim limitations as applied to claim 63 above. Dumesny et al. discloses graphically rendering the object in real-time as the user modifies texture values (see paragraph 49). Leather et al. discloses a method and apparatus for texture tiling in a graphics system (see column 4, lines 38-40) wherein the texture is configured in a tile format (see column 4, lines 1-9 and Figure 20A).

Response to Arguments

3. Applicant’s arguments, see page 7 of Applicant’s Remarks, filed 04/28/09, with respect to the 35 USC 101 rejection of claims 56-67 and 69 have been fully considered and are persuasive. The 35 USC 101 rejection of these claims has been withdrawn since amendments to claim 56 now positively tie at least one claimed step of the method to another statutory category by at least the "rendering" step being tied to at least a "graphical user interface device.”

4. Applicant's arguments filed 04/28/09 have been fully considered but they are not persuasive.

In reference to claims 56-67 and 69-75, Applicant argues that none of the cited prior art of record explicitly disclose the limitation of the user-defined region being of arbitrary shape (see pages 8-9 of Applicant’s Remarks).

In response, to the above argument as per claim 56 (and all dependent upon claim 56 claims) along with claim 70 (and all dependent upon claim 70 claims), Dumesny et al. explicitly discloses allowing a user to select a region via one or more of particular polygons of a 3D graphic object to texture map data thereto (see paragraphs 44 and 47). Further, Dumesny et al. explicitly discloses that only if no polygons are selected by a user that all polygons forming the 3D object are subsequently textured (see last 3 lines of paragraph 44). Even further however, Dumesny et al. explicitly describes the 3D graphical object of which the user is capable of texture mapping, via a selection of a region of the graphic object, as having, "...<u>arbitrarily complex surfaces</u>," (see paragraph 14 more specifically lines 1-6, right column, page 2 and paragraph 67, lines 1-5). Even further Dumesny et al. explicitly discloses the user capable of

modifying a texture mapping for an arbitrary set of the object's polygons (see paragraph 15). Therefore, the Examiner interprets at least Dumesny et al. of the combination of Dumesny et al. and Piponi et al. to disclose the argued feature since the arbitrarily complex surfaces and the modified texture for an arbitrary set of the object's polygons can surely be seen equivalent to Applicant's arbitrarily-shaped region of the claims. Also, in reference to Applicant's description of such a term from the specification, the specification utilizes the open-ended terms, "may" or "such as" to describe certain possibilities or examples of arbitrarily-shaped user-defined regions but doesn't make an exact equivalency to the term (see paragraphs 22 and 102). The Examiner states that such terms are "open-ended" meaning they do not set a stringent range or examples of values of what can be considered "arbitrarily-shaped user-defined regions." Therefore, in view of this, the Examiner states that a broad interpretation of the term "arbitrarily-shaped user-defined region" can reasonably be applied. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Therefore, the Examiner believes its interpretation of Dumesny et al. to be just especially when taking the term in its broadest sense in view of the claimed language.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Antonio Caschera whose telephone number is (571) 272-7781. The examiner can normally be reached Monday-Friday between 7:00 AM and 3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kee Tung, can be reached at (571) 272-7794.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

571-273-8300 (Central Fax)

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (571) 272-2600.

/Antonio A Caschera/

Primary Examiner, Art Unit 2628

7/23/09